

Amendment and Response

Applicant: Vladimir Abramov

Serial No.: 10/667,561

Filed: September 22, 2003

Docket No.: T395.101.101

Title: UNIVERSAL MULTIFARIOUS GEARBOX OF MUTUALLY DEFINITE UNITS AND METHOD THEREFORE

IN THE CLAIMS

Please cancel claims 16-21.

Please add claims 22-27.

Please amend claims 1-9, and 11-15 as follows:

- 1.(Currently Amended) A gearbox comprising,
a plurality of ~~shafts-gears~~ each shaft having a gear for forming a gearsets, each gearset
~~between-including at least one adjacent shafts in the gearbox extending from the~~
gearset, wherein ~~all the gearsets~~ are sized having ratios varying by degrees ~~in-of~~
separation of a common ratio in a geometric sequence.
- 2.(Currently Amended) A gearbox as in claim 1 wherein,
the degrees of separation in-of the degree of difference of the common ratio in the
geometric sequence for all gearsets ~~ratios between an adjacent pair of shafts is the~~
same.
- 3.(Currently Amended) A gearbox as in claim ~~2-1~~ wherein,
the ~~degree of separation of the common ratio of for the gearsets between the pairs of~~
~~shafts is calculated by first dividing the a number of gearset combinations of~~
forward speeds in the gearbox by ~~the a number of gearsets between two shafts,~~
where the number of gearsets between two shafts is two or more, ~~to determine the~~
~~common ratio of the gearsets between that pair of shafts,~~
~~then determining and the~~ degrees of separation of the common ratio of for the gearsets
~~between the a next pair of shafts is determined by dividing the number of degrees~~
~~of common ratio from the prior pair of shafts divided by a number of gearsets~~
between the next pair of shafts until all shaft pairs are calculated, and further
wherein the degrees of separation of the common ratio of the gearsets in the a last

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pair of shafts when calculated may have only 1 gearset between them.

4.(Currently Amended) A gearbox as in claim 2 wherein,
the gearsets are sized having a ratio varying by degrees of separation of a common ratio
in a geometric sequence equal to 1 ~~the gearset ratio values for the gearsets~~
~~between each shaft are chosen such that a combination of the gearsets selected in~~
the gearbox yields an input to output ratio of 1 to 1 ~~for the gearbox.~~

5.(Currently Amended) A gearbox as in claim 4 wherein,
a join gear on a shaft of the gearbox engages a first pinion of a first gearset on a first shaft
and a second pinion of a second gearset on a second shaft such that the join gear
is part of two gearsets of two adjacent gearset units.

6.(Currently Amended) A gearbox as in claim 5 wherein,
a pair of adjacent join gears on a shaft employs an addendum modification ~~shaft shift~~ to
account for ~~the a difference in gear teeth sizes of four gearsets installed on three~~
adjacent in spacing between the shafts due to different gear sizes in the gearsets
such that ~~the all gear teeth all are configured to mesh properly.~~

7.(Currently Amended) A gearbox as in claim 2-1 wherein,
a reverse pinion engages ~~a one gearset on an adjacent pair of shafts~~ for providing one or
more reverse speeds.

8.(Currently Amended) A gearbox as in claim 2-1 wherein,
a ~~differential~~ differential is affixed to at least one shaft of an adjacent pair of shafts.

9.(Currently Amended) A gearbox as in claim 2-1 wherein,
at least one gearset ~~the gearbox~~ has a frame member.

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10.(Original) A gearbox as in claim 2-9 wherein,
the gearbox has more than one frame member.

11.(Currently Amended) A gearbox as in claim 2-1 wherein,
at least one shaft of an adjacent pair of shafts has ~~two~~ an outward ends extending from
the gearbox for connecting to other objects.

12.(Currently Amended) A gearbox as in claim 11 wherein,
the at least one shaft of the adjacent pairs of shafts has two outward ends and a gears
disposed on each of the respective outward ends~~in the gearbox have teeth on~~
~~opposite sides and the shaft can be turned around in the gearbox to engage the~~
teeth on the opposite side of the gear configured to connect to a power source.

13.(Currently Amended) A gearbox as in claim 2-1 wherein,
the gearbox has at least one split shaft ~~that is a split with~~ and a clutch ~~to connect~~ coupled to
the split shafts.

14.(Currently Amended) A gearbox as in claim 2-1 ~~having~~ wherein,
~~5 shafts with 4 sets of gearsets between 4 pair of shafts, wherein the first set of gearsets~~
~~has 2 gearsets, the second set of gearsets has 2 gearsets, the third set of gearsets~~
~~has 2 gearsets, and the fourth set of gearsets has 3 gearsets, to produce a the~~
gearbox includes no more than thirteen gearsets and the gearsets are configured to
form the gearbox as having 24 forward speedstorques ~~when one gearset is~~
~~selected from between each pair of shafts.~~

15.(Currently Amended) A gearbox as in claim 2-14 ~~having~~ wherein,
R is a common ratio in a geometric sequence of forward speeds; and further wherein 4

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~~shafts with 3 sets of gearsets between 3 pair of are disposed on 5 shafts, and a wherein the first set of gearsets is sized having a ratio of $1/R^{12}$, a second has 2 gearsets is sized having a ratio $1/R^6$, the second set of a third gearsets is sized having a ratio $1/R^3$, a fourth has 3 gearsets, the third set of gearsets is sized having a ratio $1/R$, to produce a gearbox having 12 reverse speeds has 4 gearsets, to produce a gearbox having 24 forward speeds when one gearset is selected from between each pair of shafts.~~

16. – 21.(Canceled)

22.(New) A gearbox as in claim 14, wherein R is a common ratio in a geometric sequence, the gearbox further comprising:

- a first frame member includes a first gearset unit having gearsets sized to have a common ratio selected from the group consisting of $1/R^{12}$, $1/R^8$ and $1/R^6$;
- a second frame member includes a second gearset unit having gearsets sized to have a common ratio selected from the group consisting of $1/R^4$, $1/R^2$ and $1/R^3$;
- a third frame member includes a third gearset unit having gearsets sized to have a common ratio of $1/R$; and
- a fourth frame member includes a reverse pinion idle gear and a reverse gear coupled to a power source producing 24 reverse torques.

23.(New) A gearbox as in claim 14, wherein R is a common ratio in a geometric sequence, the gearbox further comprising:

- a frame member comprising 3 units of gearsets including:
 - a first unit having gearsets sized to have a common ratio selected from the group consisting of $1/R^{12}$ and $1/R^4$;
 - a second unit having gearsets sized to have a common ratio selected from the group consisting of $1/R^6$ and $1/R^2$; and

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a third unit having gearsets sized to have a common ratio of $1/R$, and a reverse pinion coupled to a power source to produce 12 reverse torques.

24.(New) A gearbox as in claim 14 wherein R is a common ratio in a geometric sequence, the gearbox further comprising:

a frame member includes 4 units of gearsets forming 5 shafts including:

a first unit having gearsets sized to have a common ratio selected from the group consisting of R^0 , $1/R^8$ and $1/R^3$;

a second unit having gearsets sized to have a common ratio selected from the group consisting of R^0 , $1/R^8$ and $1/R^3$;

a third unit having gearsets sized to have a common ratio selected from the group consisting of $1/R^8$, R^0 , and $1/R$; and

a fourth unit having gearsets sized to have a common ratio selected from the group consisting of R^0 and $1/R$, and a reverse pinion coupled to a power source to produce 24 reverse speeds.

25.(New) A gearbox as in claim 14, wherein R is a common ratio in a geometric sequence, the gearbox further comprising:

a frame member includes 2 units of gearsets forming 3 shafts including:

a first unit having gearsets sized to have a common ratio selected from the group consisting of $1/R^6$ and $1/R^4$; and

a second unit having gearsets sized to have a common ratio of $1/R$, and a reverse pinion coupled to a power source to produce 6 reverse speeds.

26.(New) A gearbox as in claim 14, wherein R is a common ratio in a geometric sequence, the gearbox further comprising:

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a frame members comprising 4 units of gearsets forming 5 shafts, including a first split input shaft and a second split input shaft such that the gearbox produces an additional 12 forward torques; and

a first unit having a gearsets sized to have a common ratio of R^0 ;

a second unit having 2 gearsets sized to have a common ratio of $1/R^{12}$;

a third unit of gearsets having gearsets sized to have a common ratio selected from the group consisting of $1/R^4$ and $1/R^3$; and

a fourth unit of gearsets having gearsets sized to have a common ratio of $1/R$, and a reverse pinion coupled to a power source to produce 24 reverse speeds.

27.(New) A method of gearbox design comprising:

selecting a number of torques for the gearbox;

determining a number of gearset units based upon a multiplier number representative of the number of torques selected;

providing a number of gearsets in each gearset unit based upon the number of torques selected;

determining a number of shafts equal to the number of gearset units plus one;

determining a degree of separation of a common ratio in a geometric sequence for each gearset unit by dividing the number of torques selected by the number of gearsets in a first gearset unit, and then dividing a remainder of the degree of separation of the common ratio by the number of gearsets in a second gearset unit;

repeating a division step for remaining units until the degree of separation of the common ratio equals one.